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Title: METHODS AND APPARATUS FOR MODIFYING A RETENTION PERIOD FOR DATA IN A STORAGE SYSTEM

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AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of processing data in a computer system comprising at least one host and at least one content addressable storage (CAS) system, wherein the at least one host identifies units of data on the at least one CAS system using content addresses each generated based, at least in part, on at least a portion of the content of the corresponding unit of data, the at least one CAS system storing at least one unit of data having a previously-defined retention period, the method comprising acts of:

(A) receiving, at the at least one CAS system, a request from the at least one host to reduce a length of the retention period for the at least one unit of data, the retention period specifying a time during which the at least one unit of data cannot be deleted from the at least one CAS system; [[and]]

(B) reducing the length of the retention period for the at least one unit of data in response to the request;

(C) maintaining on the at least one CAS system at least one record for the unit of data, the at least one record storing a history of the reduction of the previously defined retention period;

(D) receiving, at the at least one CAS system, a request from the at least one host to restore the retention period to the length of the previously-defined retention period for the at least one unit of data; and

(E) restoring the retention period to the length of the previously-defined retention period in response to the request.

2. (Original) The method of claim 1, wherein the request comprises an event command indicating the occurrence of an event.

3. (Previously Presented) The method of claim 2, wherein the event command does not specify the amount by which the retention period is to be reduced, and wherein the act (B) further comprises an act of determining the amount by which the retention period is to be reduced by referring to information stored within or accessible to the CAS system.

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4. (Original) The method of claim 1, wherein the request specifies that the retention period be reduced and the manner in which the length of the retention period is to be reduced.
5. (Previously presented) The method of claim 1, wherein the at least one CAS system stores the previously-defined retention period within the unit of data, and wherein the act (B) further comprises replacing the unit of data with a new unit of data having the reduced retention period.
6. (Previously presented) The method of claim 1, wherein the at least one CAS system stores the previously-defined retention period in a record outside of the unit of data, and wherein the act (B) further comprises modifying the record to reduce the previously-defined retention period.
7. (Previously presented) The method of claim 1, wherein the at least one CAS system is responsive to access requests from the at least one host that reference a content address for the unit of data that is generated based on the content of the unit of data.
8. (Original) The method of claim 7, wherein the content address the unit of data is generated based on only a first portion of the content of the unit of data and not on a second portion of the content of the unit of data.
9. (Previously presented) The method of claim 8, wherein the at least one CAS system stores the previously-defined retention period in the second portion of the content of the unit of data on which generation of the content address is not based, and wherein the act (B) further comprises an act of reducing the previously-defined retention period specified in the second portion of the content of the unit of data.
10. (Original) The method of claim 1, wherein the act (B) further comprises acts of:
(B1) determining whether the previously-defined retention period for the unit of data is permitted to be reduced; and

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(B2) reducing the length of the previously-defined retention period only when the previously-defined retention period for the unit of data is permitted to be reduced.

11. (Original) The method of claim 10, wherein the act (B1) further comprises determining whether at least one of the unit of data and the previously-defined retention period is within a class designated as capable of having the retention period reduced.

12. (Original) The method of claim 11, wherein the act (B1) further comprises determining whether at least one of the unit of data and the previously-defined retention period is within the class designated as capable of having the retention period reduced by examining the previously-defined retention period.

13. (Original) The method of claim 11, wherein the act (B1) further comprises determining whether at least one of the unit of data and the previously-defined retention period is within the class designated as capable of having the retention period reduced by examining a flag associated with the unit of data.

14. (Original) The method of claim 1, wherein the act (B) further comprises an act of reducing the length of the previously-defined retention period to zero.

15. (Original) The method of claim 1, wherein the act (B) further comprises an act of deleting the unit of data.

16. (Original) The method of claim 15, further comprising an act of:
creating an audit log entry that records information about the deletion of the unit of data.

17. (Original) The method of claim 15, further comprising an act of creating a new unit of data to replace the deleted unit of data, the new unit of data having a retention period shorter than the previously-defined retention period.

18. (Cancelled)

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19. (Cancelled)

20. (Currently Amended) At least one computer readable storage medium encoded with instructions that, when executed on a computer system, perform a method of processing data, wherein the computer system comprises at least one host and at least one content addressable storage (CAS) system, wherein the at least one host identifies units of data on the at least one CAS system using content addresses each generated based, at least in part, on at least a portion of the content of the corresponding unit of data, the at least one CAS system storing at least one unit of data having a previously-defined retention period, the method comprising acts of:

(A) receiving, at the at least one CAS system, a request from the at least one host to reduce a length of the retention period for the at least one unit of data, the retention period specifying a time during which the at least one unit of data cannot be deleted from the at least one CAS system; [[and]]

(B) reducing the length of the retention period for the at least one unit of data in response to the request;

(C) maintaining on the at least one CAS system at least one record for the unit of data, the at least one record storing a history of the reduction of the previously defined retention period;

(D) receiving, at the at least one CAS system, a request from the at least one host to restore the retention period to the length of the previously-defined retention period for the at least one unit of data; and

(E) restoring the retention period to the length of the previously-defined retention period in response to the request.

21. (Previously Presented) The at least one computer readable storage medium of claim 20, wherein the request comprises an event command indicating the occurrence of an event.

22. (Previously Presented) The at least one computer readable storage medium of claim 21, wherein the event command does not specify the amount by which the retention period is to be reduced, and wherein the act (B) further comprises an act of determining the amount by which

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the retention period is to be reduced by referring to information stored within or accessible to the at least one CAS system.

23. (Previously Presented) The at least one computer readable storage medium of claim 20, wherein the request specifies that the retention period be reduced and the manner in which the length of the retention period is to be reduced.

24. (Previously Presented) The at least one computer readable storage medium of claim 20, wherein the at least one CAS system stores the previously-defined retention period within the unit of data, and wherein the act (B) further comprises replacing the unit of data with a new unit of data having the reduced retention period.

25. (Previously Presented) The at least one computer readable storage medium of claim 20, wherein the at least one CAS system stores the previously-defined retention period in a record outside of the unit of data, and wherein the act (B) further comprises modifying the record to reduce the previously-defined retention period.

26. (Previously Presented) The at least one computer readable storage medium of claim 20, wherein the at least one CAS system is responsive to access requests from the at least one host that reference a content address for the unit of data that is generated based on the content of the unit of data.

27. (Previously Presented) The at least one computer readable storage medium of claim 26, wherein the content address the unit of data is generated based on only a first portion of the content of the unit of data and not on a second portion of the content of the unit of data.

28. (Previously Presented) The at least one computer readable storage medium of claim 27, wherein the at least one CAS system stores the previously-defined retention period in the second portion of the content of the unit of data on which generation of the content address is not based, and wherein the act (B) further comprises an act of reducing the previously-defined retention period specified in the second portion of the content of the unit of data.

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29. (Previously Presented) The at least one computer readable storage medium of claim 20, wherein the act (B) further comprises acts of:

(B1) determining whether the previously-defined retention period for the unit of data is permitted to be reduced; and

(B2) reducing the length of the previously-defined retention period only when the previously-defined retention period for the unit of data is permitted to be reduced.

30. (Previously Presented) The at least one computer readable storage medium of claim 29, wherein the act (B1) further comprises determining whether at least one of the unit of data and the previously-defined retention period is within a class designated as capable of having the retention period reduced.

31. (Previously Presented) The at least one computer readable storage medium of claim 30, wherein the act (B1) further comprises an act of determining whether at least one of the unit of data and the previously-defined retention period is within the class designated as capable of having the retention period reduced by examining the previously-defined retention period.

32. (Previously Presented) The at least one computer readable storage medium of claim 30, wherein the act (B1) further comprises an act of determining whether at least one of the unit of data and the previously-defined retention period is within the class designated as capable of having the retention period reduced by examining a flag associated with the unit of data.

33. (Previously Presented) The at least one computer readable storage medium of claim 20, wherein the act (B) further comprises an act of:
reducing the length of the previously-defined retention period to zero.

34. (Previously Presented) The at least one computer readable storage medium of claim 20, wherein the act (B) further comprises an act of deleting the unit of data.

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35. (Previously Presented) The at least one computer readable storage medium of claim 34, wherein the method further comprises an act of creating an audit log entry that records information about the deletion of the unit of data.

36. (Previously Presented) The at least one computer readable storage medium of claim 34, wherein the method further comprises an act of creating a new unit of data to replace the deleted unit of data, the new unit of data having a retention period shorter than the previously-defined retention period.

37. (Cancelled)

38. (Cancelled).

39. (Currently Amended) A storage system for use in a computer system including the storage system and at least one host, wherein the storage system is a content addressable storage (CAS) system, and wherein the at least one host identifies units of data on the at least one CAS system using content addresses generated based, at least in part, on at least a portion of the content of the corresponding unit of data, the storage system comprising:

at least one storage device to store at least one unit of data received from the at least one host, the unit of data having an associated retention period during which the at least one unit of data cannot be deleted from the storage system; and

at least one controller that is adapted to:

receive a request from the at least one host to reduce a length of the retention period for the at least one unit of data; [[and]]

reduce the length of the retention period for the at least one unit of data in response to the request;

maintain on the at least one CAS system at least one record for the unit of data, the at least one record storing a history of the reduction of the previously defined retention period;

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receive, at the at least one CAS system, a request from the at least one host to restore the retention period to the length of the previously-defined retention period for the at least one unit of data; and

restore the retention period to the length of the previously-defined retention period in response to the request.

40. (Original) The storage system of claim 39, wherein the request comprises an event command indicating the occurrence of an event.

41. (Previously Presented) The storage system of claim 40, wherein the event command does not specify the amount by which the retention period is to be reduced, and wherein the at least one controller is adapted to determine the amount by which the retention period is to be reduced by referring to information stored within or accessible to the storage system.

42. (Original) The storage system of claim 39, wherein the request specifies that the retention period be reduced and the manner in which the length of the retention period is to be reduced.

43. (Original) The storage system of claim 39, wherein the storage system stores the retention period within the unit of data, and wherein the at least one controller is adapted to replace the unit of data with a new unit of data having the reduced retention period.

44. (Original) The storage system of claim 39, wherein the storage system stores the retention period in a record outside of the unit of data, and wherein the at least one controller is adapted to modify the record to reduce the previously-defined retention period.

45. (Previously presented) The storage system of claim 39, wherein the at least one storage system is responsive to access requests from the at least one host that reference a content address for the unit of data that is generated based on the content of the unit of data.

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46. (Original) The storage system of claim 45, wherein the content address for the unit of data is generated based on only a first portion of the content of the unit of data and not on a second portion of the content of the unit of data.
47. (Original) The storage system of claim 46, wherein the storage system stores the retention period in the second portion of the content of the unit of data on which generation of the content address is not based, and wherein the at least one controller is adapted to reduce the retention period specified in the second portion of the content of the unit of data.
48. (Original) The storage system of claim 39, wherein the at least one controller is adapted to: determine whether the retention period for the unit of data is permitted to be reduced; and reduce the retention period only when the retention period for the unit of data is permitted to be reduced.
49. (Original) The storage system of claim 48, wherein the at least one controller is adapted to determine whether at least one of the unit of data and the retention period is within a class designated as capable of having the retention period reduced.
50. (Original) The storage system of claim 49, wherein the at least one controller is adapted to determine whether the at least one unit of data and the retention period is within the class designated as capable of having the retention period reduced by examining the retention period.
51. (Original) The storage system of claim 49, wherein the at least one controller is adapted to determine whether the at least one unit of data and the retention period is within the class designated as capable of having the retention period reduced by examining a flag associated with the unit of data.
52. (Original) The storage system of claim 39, wherein the request specifies to reduce the length of the retention period, and wherein the at least one controller is adapted to reduce the length of the retention period to zero in response to the request.

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53. (Original) The storage system of claim 39, wherein the request specifies to delete the unit of data, and wherein the at least one controller deletes the unit of data in response to the request.

54. (Original) The storage system of claim 53, wherein the at least one controller is adapted to create an audit log entry that records information about the deletion of the unit of data.

55. (Original) The storage system of claim 53, wherein the at least one controller is adapted to create a new unit of data to replace the deleted unit of data, the new unit of data having a second retention period shorter than the retention period.

56. (Cancelled)

57. (Cancelled)

58. (Currently Amended) A method of processing data in a computer system comprising at least one host and at least one content addressable storage (CAS) system, wherein the at least one host identifies units of data on the at least one CAS system using content addresses generated based, at least in part, on at least a portion of the content of the unit of data, the at least one CAS system storing at least one unit of data having a previously-defined retention period, the method comprising acts of:

(A) sending, from the at least one host, a request to the at least one CAS system to reduce a length of the retention period for ~~[[that]]~~ the at least one unit of data, wherein the retention period specifies a time during which the at least one unit of data cannot be deleted from the at least one CAS system; ~~[[and]]~~

(B) receiving, from the at least one CAS system, a response indicating that the request was granted; and

(C) sending, from the at least one host, a second request to the at least one CAS system to restore the retention period to the length of the previously-defined retention period for the at least one unit of data.

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59. (Original) The method of claim 58, further comprising an act of sending the request in response to the occurrence of an event.
60. (Original) The method of claim 58, wherein the request comprises an event command indicating the occurrence of an event.
61. (Original) The method of claim 60, wherein the event command does not specify the manner in which the retention period is to be reduced.
62. (Original) The method of claim 58, wherein the request specifies that the retention period is to be reduced and the manner in which the length of the retention period is to be reduced.
63. (Previously presented) The method of claim 58, wherein the at least one host accesses the unit of data stored on the at least one CAS system using a content address generated based on the content of the unit of data.
64. (Cancelled).
65. (Currently Amended) At least one computer readable storage medium encoded with instructions that, when executed on a computer system, perform a method of processing data, wherein the computer system comprises at least one host and at least one content addressable storage (CAS) system, wherein the at least one host identifies units of data on the at least one CAS system using content addresses generated based, at least in part, on at least a portion of the content of the corresponding unit of data, the at least one CAS system storing at least one unit of data having a previously-defined retention period, the method comprising acts of:
- (A) sending, from the at least one host, a request to the at least one CAS system to reduce a length of the retention period for ~~[[that]]~~ the at least one unit of data, the retention period specifying a time during which the at least one unit of data cannot be deleted from the at least one CAS system; ~~[[and]]~~

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(B) receiving, from the at least one CAS system, a response indicating that the request was granted; and

(C) sending, from the at least one host, a second request to the at least one CAS system to restore the retention period to the length of the previously-defined retention period for the at least one unit of data.

66. (Previously Presented) The at least one computer readable storage medium of claim 65, wherein the method further comprises an act of sending the request in response to the occurrence of an event.

67. (Previously Presented) The at least one computer readable storage medium of claim 65, wherein the request comprises an event command indicating the occurrence of an event.

68. (Previously Presented) The at least one computer readable storage medium of claim 67, wherein the event command does not specify the manner in which the retention period is to be reduced.

69. (Previously Presented) The at least one computer readable storage medium of claim 65, wherein the request specifies that the retention period is to be reduced and the manner in which the length of the retention period is to be reduced.

70. (Previously Presented) The at least one computer readable storage medium of claim 65, wherein the at least one host accesses the unit of data stored on the at least one CAS system using a content address generated based on the content of the unit of data.

71. (Cancelled)

72. (Currently Amended) A host computer for use in a computer system that includes the host computer and at least one CAS system, wherein the at least one host identifies units of data on the at least one CAS system using content addresses generated based, at least in part, on at least a portion of the content of the corresponding unit of data, the at least one CAS system

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storing, for the at least one host, at least one unit of data having a previously-defined retention period, the host computer comprising:

at least one storage device; and

at least one controller, coupled to the at least one storage device, that is adapted to send a request to the at least one CAS system to reduce a length of the retention period for that at least one unit of data, [[and]] receive, from the at least one CAS system, a response indicating that the request was granted, and send a second request to the at least one CAS system to restore the retention period to the length of the previously-defined retention period for the at least one unit of data, wherein the retention period specifies a time during which the at least one unit of data cannot be deleted from the at least one CAS system.

73. (Original) The host computer of claim 72, wherein the at least one controller is adapted to send the request in response to the occurrence of an event.

74. (Original) The host computer of claim 72, wherein the request comprises an event command indicating the occurrence of an event.

75. (Original) The host computer of claim 74, wherein the event command does not specify the manner in which the retention period is to be reduced.

76. (Original) The host computer of claim 72, wherein the request specifies that the retention period is to be reduced and the manner in which the length of the retention period is to be reduced.

77. (Previously presented) The host computer of claim 72, wherein the host computer is adapted to access the unit of data stored on the at least one CAS system using a content address generated based on the content of the unit of data.

78. (Cancelled)

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79. (Previously presented) The host computer of claim 72, in combination with the at least one CAS system.

80. (Previously presented) The host computer of claim 72, wherein the at least one controller comprises:

means for sending a request to the at least one CAS system to reduce a length of the retention period for that at least one unit of data.